DOCUMENT RESUME

ED 384 983 EA 026 878

AUTHOR Brydges, Bruce
TITLE A Method To Ensure Heterogeneous Mixing of Grade 9 Classes.
PUB DATE 93
NOTE 62p.; Ed.D. Practicum Report, Nova Southeastern University.
PUB TYPE Dissertations/Theses - Practicum Papers (043)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Classroom Desegregation; Database Management Systems; Foreign Countries; Grade 9; *Grouping (Instructional Purposes); *Heterogeneous Grouping; Mainstreaming; Management Information Systems; *Nongraded Instructional Grouping; Secondary Education; *Student Placement
IDENTIFIERS *Ontario

ABSTRACT

This paper presents outcomes of a practicum that was designed to address a need that was created when the Ministry of Education in Ontario, Canada, mandated that all grade 9 classes be "destreamed." A review of educational literature found no methods for ensuring that classes are truly heterogeneously mixed. The practicum was designed to gather data on each student entering grade 9 in order to ensure that classes were mixed according to the following variables: academic ability, gender, special-education identification, and feeder school of origin. Using a holistic scoring rubric, mean scores and standard deviations were developed to guide the placement of students in a timetable designed to support heterogeneously mixed student cohorts. The plan was implemented in a large, modern, rural, composite secondary school in Ontario (Canada). Findings demonstrated that heterogenous mixing could be achieved for core classes; however, students tended to stream themselves through the choice of optional subjects. Four tables are included. Appendices contain the holistic rating scale, the grade 9 student timetable, and a sample database setup for Lotus 1-2-3. Contains 34 references. (Author/LMI)

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A Method to Ensure Heterogeneous Mixing of Grade 9 Classes

by

Bruce Brydges

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A Practicum Report Presented to the Ed.D. Program in Child and Youth Studies in Partial Fulfillment of the Requirements for the Degree of Doctor of Education

NOVA SOUTHEASTERN UNIVERSITY

1993

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January 3, 1995

This practicum report was submitted by Bruce Carl Brydges under the direction of the adviser listed below. It was submitted to the Ed. D. Program in Child and Youth Studies and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

Date: 2/22/95

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ABSTRACT

A Method to Ensure Heterogeneous Mixing of Grade 9 Classes. Brydges, Bruce C., (1995): Practicum Report, Nova Southeastern University, Ed. D. Program in Early and Middle Childhood. School Management and Instructional Leadership/Academic Administration /Educational Research/General Administration/Policy/Procedures/ Middle School/Organizational Structure/Reorganization/Strategic planning/Adolescents/Students/Teachers.

This practicum was designed to address a need which was created when the Ministry of Education in Ontario, Canada, mandated that all Grade 9 classes would be destreamed. While the literature is somewhat inconclusive regarding the benefits of heterogeneously mixing ability groups for instruction, there is virtually no literature which describes methods for ensuring that classes are truly heterogeneously mixed.

The writer designed the practicum to gather data on each student entering grade 9 for the purpose of ensuring that classes were demonstrably mixed according to the following variables: academic ability, gender, special education identification, and feeder school of origin. Using a holistic scoring rubric, mean scores and standard deviations were developed to guide the placement of students in a timetable especially designed to support heterogeneously mixed cohorts of students. The result demonstrated that it is possible to demonstrate heterogeneous mixing for core classes however the results also showed that students tend to stream themselves through the choice of optional subjects.

All decisions for the practicum were made collaboratively with the high school administration along with various advisory committees. Further research is recommended to observe the instructional effects of this method of heterogeneous mixing and to determine if the benefits of such an approach are superior to those where mixing has been administered in a more indiscriminate manner.

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CHAPTER I

INTRODUCTION

Description of Community

The study school for this practicum was a large, modern, rural, composite secondary school serving the educational needs of some 1,200 students with eighty-five percent of the students bussed from the three surrounding counties. Thirteen feeder schools comprised the Associated School Grouping (ASG) for the study school. The school offered a wide range of programmes at all levels of difficulty and included a french immersion program, a large cooperative education component and a very large co-curricular programme including interscholastic teams at all three age levels of competition in most major sports. There was also a large battery of clubs and other organizations supported by a traditionally strong student government. Each year, grade 9 students promoted or transferred into secondary school (on average approximately 260 students) participated in two special orientation activities. In

June, the guidance department along with a strong peer helper program, organized a special orientation day for all incoming grade 8 students which provided them with the opportunity to meet students from all other feeder schools and to tour the secondary school. Then, early in September, these students participated in a separate orientation activity, whereby members of the student government and the activities council (senior students) facilitated a series of social (fun) activities to assist in the transition from Grade 8 to Grade 9.

The school staff and heads' meetings were organized so that school atmosphere was reviewed systematically and regularly. The atmosphere at the school was described as dynamic, open, and co-operative. This has promoted good citizenship and a work ethic among students and staff that was in harmony with the fundamental rural work ethic which accompanies the traditional expectations of the parents in the community. Further expectations of respect for others and a sense of common purpose were clearly stated in a published "Code of Behaviour". Parents were communicated with regularly through a series of newsletters. These newsletters, the course booklet, programmes for special events such as music nights, graduation and the academic and athletic banquets were produced by the in-house desk-top publishing facility. The school took part in local, community-oriented radio broadcasts and students wrote regular columns for the local newspaper.

The staff as a whole have been described as a unique blend of youth and experience with varied backgrounds and a real sense of service to the students. Eleven of the 92 teachers on staff were associates for a major faculty of education at a well respected local university.

The demographic profile of the school was very consistent with other rural secondary schools in Ontario with virtually no experience of the ethno-cultural conflict

The principal of the school with whom the writer worked with extensively during this practicum, was described by his peers as a risk taker. He has been zealously concerned about quality education. His style of leadership was described again by his peers as collaborative and most importantly, he consistently has had the best educational interests of the students utmost in mind with every decision that was made regarding school organization.

The Writer's Work Setting and Role

The writer was a research and assessment resource teacher for a rural school board which served 9 secondary schools, 53 elementary schools and 4 alternative learning centres. For five years, the writer was involved professionally as a guidance and special education teacher in the large composite secondary school which provided the setting for this practicum. The role of the writer for the purposes of this practicum was to draw from his experience as a co-chair of the Grade 9 Homebase Committee, as chair

of the Advisory Council for Restructuring, and as an active member of the Steering Committee for the Transition Pilot Project, and bring together resources for the purpose of advising the school administration in the implementation of this practicum.

CHAPTER II

STUDY OF THE PROBLEM

Problem Description

In October 1992, the Ministry of Education for the Province of Ontario, Canada, mandated through a Policy Program Memorandum No. 115, that "The Grade 9 program shall no longer be organized according to levels of difficulty". (Lane, 1992) In other words, all grade 9 classes would become "destreamed" and the deadline for such a change was given as September 1993. The Ministry did not define a destreamed class any further than this simple statement. In Ontario, such destreamed classes have existed in the past only in elementary schools (Kindergarten to Grade 8). When students were promoted or transferred to a secondary school, they have been expected to not only choose the options they will be studying, but also the level of difficulty at which they will be studying. In most secondary schools these levels have included a) advanced, b) general, c) basic in declining order of ability needed to be successful and with outcomes ranging from university (advanced level), community college (general level), and preparation for the world of work (basic level).

The dilemma or situation which was created by the Ministry mandate was how to create a truly destreamed class. The placement of optional courses, the preference of students according to their success in their elementary school classes, the gender of the student, the ethnicity of the student, the influence of peers, and the pressures and expectations of parents all combine to force students into making choices which in effect cause them to stream themselves according to their choices.

In summary, the problem was a new one created by an educational change mandated by the Ministry of Education. After decades of streaming students in grade 9, school boards were being asked to "destream" their grade 9 program and aside from the criteria that these classes would not group students according to ability or difficulty of instructional levels, there was no guidance as to how best to achieve this outcome.

Problem Documentation

The problem or situation described above could have been rectified a number of ways. For instance, secondary schools could have simply removed the level of difficulty from the coding of each course and allowed students to simply select their options of study. Unfortunately, this simplistic approach would have resulted in additional difficulties. As stated above, students tend to stream

themselves according to their choices. Teachers were the first to acknowledge this dynamic existed as they report having received classes which were "good", "bad", "bright", "slow", or "challenging" just to use a few of the common adjectives.

At the writer's school during the 1992-93 school year, family studies courses at the grade 9 general level were comprised of 99% female students. Conversely, grade 9 technical subjects such as electricity, drafting, woodworking and auto shop reported having no more than three females in any given class. An advanced level english class which was timetabled at the same time as the technical subjects was reported by the teacher as being a particularly "bright" class. Conversely an advanced level english class timetabled at the same time as a french class was characterized by the same teacher as "dull". It seemed that students had indeed streamed themselves according to the courses which they chose as options and classes were skewed accordingly.

In a survey conducted by the writer and some of his colleagues recently with streamed grade 9 classes, students were given a choice of 13 variables which influenced them when choosing their courses for the coming year. Students indicated whether variables were "very important", "important", "moderately important", or "unimportant". Each of these variables were given a numerical value in descending

order. The top four important reasons given for student consideration when selecting courses were in descending order: (a) amount of homework I have heard is given in the course, (mean = 2.69) (b) I like the teacher who will be teaching the course, (mean = 2.68) (c) friends will be taking the same course,(mean = 2.63) and (d) a teacher recommended the course (mean = 2.60) (Brydges & Cousins, 1993). It was evident from these results that with this kind of criteria in operation, students stream themselves.

Causative Analysis

Simply stated, the situational problem of how to place students in classes to ensure that they are truly destreamed was created by the mandate of the Ministry of Education to eliminate levels of difficulty for grade 9 students. The writer can only conjecture as to why the Ministry did not go about prescribing a method for this, however as with the majority of top-down decisions, consultation for this change was non-existent and it was left to the practitioners to interpret and implement change.

There were however at least three major benefits to this lack of guidance from above. Firstly, the administrative responsibility of placing students in classes presented a prime opportunity for site-based management. Much has been said in recent restructuring

literature about the importance of schools reflecting the unique community values of the communities in which they exist. The make-up of destreamed classes could be a decision of an advisory council comprised of feeder school representatives, parents, local businesses, teachers, and students along with school administration. Secondly, communication with the elementary feeder schools potentially could be enhanced through a process that engaged them in a role for destreaming classes. The cultural chasm that exists between elementary school and secondary schools was a major focus in the literature encouraging restructuring. Any activity which facilitated the bridging of this gap was laudatory. Finally, much needed and enhanced holistic data could be gathered regarding each student as he/she graduated or was transferred from elementary school. The value of this data would supersede previous information received through report card histories and could also assist homebase teachers in aiding students in establishing personal goals throughout high school. This qualitative data could be quantified to assist the placement of students into classes ensuring the classes heterogeneous nature.

Relationship of the Problem to the Literature

While there has been much research in the area of streaming, there has been very little in Canada and especially at the secondary level.

This literature review has been divided into three perspectives on destreaming: historical, educational and political/socio-economic.

Historical Perspective

Ontario's early education system has been reported by Oliver et al.(1984), as principally church initiated and church driven. In 1871, Edgerton Ryerson developed the public school system as he took up the cause of one, universal tax-supported system. At the end of the nineteenth century, Ontario was experiencing two major changes in the characteristics of its population: (a) the movement from rural to urban centres and (b) a dramatic increase in the number of non-English, poor immigrants. (Oliver, et al. 1984)

Oliver et al. (1984), went on to state that to address the perceived needs of these new Canadians while continuing to meet the educational needs of the affluent families, an apparently logical practice called streaming or tracking was developed. In Ontario, the "New Education" Movement introduced vocational schooling with the opening of the Toronto Technical School in 1891. As a result, and with what seemed to be the best of intentions,streaming has been a fundamental part of the educational system in Ontario for over 100 years. Ontario's "Matriculation", "Technical" and "Commercial" streams of the 1930's have undergone several name changes and at time of writing was referred

to as "advanced", "general", and "basic" streams.

Stamp (1982) stated that as mental testing instruments emerged during the inter-war years, the construction of large technical and commercial secondary schools expanded. The "scientific" mental testing instruments were used to defend and support the trend of streaming students into programs of different levels of difficulty. He also stated that it became very difficult for parents to oppose the decision of educational "experts" with scientific instruments to measure students' ability.

By the end of the 1950's, the post war "baby boomers" were entering secondary school and the space to accommodate them was becoming scarce. In 1961, the federal government in partnership with Ontario education officials announced what was to become known as the Robarts Plan. The Robarts Plan provided unlimited federal funding to build new schools as long as at least 50 percent of the students' time was taken up with technical, commercial or vocational training. The result was the biggest increase in streaming in Ontario's secondary school history. From 1961 to 1967 the percentage of students enrolled in the technical and commercial programs doubled. Under the Robarts Plan, students entering secondary school were directed into one of three streams: a five year, university bound program; a four year technical/commercial program; or a two year vocational program (Stamp, 1984).

In 1969, the Robarts Plan was replaced with an Ontario-wide "credit system" that was designed to provide students with opportunity to "select" courses. While it was true that the students could choose from courses offered by the individual school in which they enrolled, the choices were restricted to the courses that each school offered. As a legacy of the Robarts Plan, several hundred new technical commercial, and vocational high schools remained. The courses offered at each school under the credit system closely reflected the level at which the school had operated in the past. Vocational schools were built in working class areas with the result being the streaming of working class students into lower streamed schools and programs. The streaming of the Robarts Plan remained camouflaged in the credit system that offered "choice". The credit system remained while the Ministry of Education insisted that courses and not students were labelled as advanced, general, and basic.

Educational Perspective

There has been much educational research from many countries that supported the destreaming decision by the Ministry. In a review of the research in Canada, the United States and Britain, it was found that twenty-eight researchers supported streaming, while seventy-six argued against it (Smaller, 1990).

In the last 50 years there have been more than 700 studies on ability grouping. Most of the research revealed that teacher expectations were lower for low-track students and that tracking often resulted in a grouping of discouragement. Lower self-esteem seemed to flourish in lower tracks creating an anti-school attitude resulting in a higher drop-out rate amongst these students (Smaller, 1990).

Over 88 per cent of students in the advanced level programs were successful in graduating with a high school diploma but only 38 per cent of students in general level, and 21 percent of those in basic programs graduated from high schools (Smaller, 1990). Smaller also reports that many teachers were concerned for the students in the basic and general programs, posing the question, "Would these students be provided with the opportunities or have the ability to succeed in a heterogeneous classroom environment?" Other teachers and parents worried that the students in the advanced level programs would be held back and not be challenged in a heterogeneous ability setting.

Dreeben and Barr (1988), argued that sound instructional and organization techniques, including intelligent homogeneous grouping combined with intelligent means of instruction of those homogeneous groups led to superior results in some schools in the United States. However, Willms and Chen (1989) suggested that, based on their research in Israeli schools, streaming and destreaming resulted in a zero-sum

gain: the higher streams' gains were offset by the lower streams' losses.

McLean (1989) indicated that Ontario education has carried the burden of the costs of streaming while reaping no benefits. Recent newspaper reports have indicated that Ontario students' scores ranked below international averages in mathematics and science.

In most cases, research on whole class instruction has been found to be a more effective method of instruction than group work, individualized work or streamed ability classes. Coleman and Hoffer (1987) found that American Catholic high schools which were destreamed had been more academically successful with low ability and low social status students than streamed, comprehensive public high schools.

Every report from 1976 to 1988 on Ontario's Secondary Schools has criticized streaming directly or indirectly. King (1986) found that there was considerable diversity in the content of the general level courses and a significant percentage of the students in general level courses dropped out due to dissatisfaction with school. His research indicated that a student in general level courses was not prepared for the work world or community college and was four times more likely to drop out than a student taking advanced level courses.

Karp (1988), found that while general level courses did relieve pressure on the student to compete academically with a more difficult

curricula, they have contributed to lower self-esteem, a major factor in the drop-out problem. Radwanski (1987), also stated that the drop-out problem was caused by ability grouping at the secondary school. In his report, Ontario Study of the Relevance of Education, and the Issue of Dropouts (1987), Radwanski referred to "powerful evidence" that suggests that ability grouping restricts the education of pupils in the lower tracks without benefitting those in higher tracks. Despite Radwanski's claim, the on-going research by Slavin, (1988) and Kulik and Kulik, (1982) has produced seemingly contradictory findings.

Advantages of streaming

* High achievers move more rapidly through their course work.
* Low achievers have attainable goals and are given extra help.
* All students receive more individualized instruction.
* Students have a better attitude toward particular subjects.
* More students have a positive attitude toward school.
* All students have higher self-esteem.

Disadvantages of streaming

* High achievers constitute an elite group and gain at the expense of low achievers.
* Low achievers are stigmatized to the detriment of their self-esteem and motivation to work.
* Teachers expect poor academic achievement and behaviour from low achievers and adopt a slower instructional pace when teaching them.
* Low-ability students lack good academic role models.
* There are discernable academic benefits only for gifted high achievers. (Slavin, 1988; Kulik and Kulik, 1982)

King and Peart's (1990) study of Ontario secondary schools, The

Good School, discovered that in even the "best of our schools" over 10 percent of the students were not satisfied. King concluded that "there may be students who simply cannot be touched by programs, procedures, and policies currently available to secondary school educators" (p.11).

It was generally agreed that streaming is less desirable for low-achieving students. When low-ability students were integrated, they tended to achieve at a higher level. The main reason given for this was that they were more likely to be assigned homework regularly since homework was more often assigned in an integrated (destreamed) class, and not expected of low-ability students in a streamed class (King and Peart, 1990, p. 48).

A major stumbling block in the path to change to a destreamed Grade 9 was the teachers' academic orientation towards subject matter and content (Boyd and Crowson, 1982). Embracing a narrow view of achievement as academic, created large rates of failure by definition (Hargreaves & Earle, 1990). Students in lower streams felt less connected to their school than their higher stream counterparts (Goodlad, 1984). In Ontario high schools, if students did not belong, they were generally perceived as "losers" (Lawton, Leithwood et al., 1988).

King's (1986) Ontario study, The Adolescent Experience, revealed that 18.2 per cent of secondary students in the basic stream achieved an

average mark below 65 per cent; for students in the general stream, the figure jumped to 38.6 per cent who had averages below 65 per cent yet only 12.6 per cent of students in the advanced stream achieved an average mark below 65 per cent. Since the premise behind streaming students was to provide curricula appropriate to the students' ability, these results have been very thought provoking. Research suggested that students in the lower streams formed peer groups that resisted institutional norms and subverted classroom routines and procedures (Good and Marshall, 1984). Goodlad (1984) stated that "students in the lower tracks were the least likely to experience the types of instruction most highly associated with achievement" (p. 155).

Gamoran (1987) found that placement in the higher streams gave students significant achievement advantages in mathematics, science, reading, vocabulary, writing and social studies. However, Slavin (1990) with regard to the effect of ability grouping on students achievement stated that "ability grouping has no consistent positive or negative effects on students of high, average, or low ability" (p. 27). Slavin's research findings were consistent with those of Kulik and Kulik (1982).

Political and Socio-economic Perspective

The introduction of the destreaming initiative through the Speech

from the Throne in April 1989, highlighted the political sensitivity that the issue of destreaming had created. The reasons for a change to a destreamed grade nine in Ontario have been many, however, the impetus behind the destreaming movement has come from the government of Ontario.

With the strong indictment of homogeneous ability groupings in Ontario secondary schools by Radwanski (1987) and research data that clearly demonstrated that the children of working class, ethnic/racial minorities, and single parent families were over-represented in lower stream programs, the government found the education system to be non-egalitarian.

Initially, it appeared the change to destreaming was a political reaction to the Radwanski report and other groups who argued that streaming discriminated against students on socio-economic, ethnic and cultural grounds. There was very little consultation with educational experts from outside Ontario and a very scant examination of the limited Ontario based research on the topic of destreaming. The majority of Ontario Boards of Education displayed very little ethnic diversity. The issue of over representation of minority, ethnic and socio-economically disadvantaged students in lower streamed programs was and continued to be mainly a concern in schools in Toronto.

In an American study of six racially and ethnically mixed schools

in which whites did not account for more than 53 per cent of the student body, 62 per cent of the students in the higher streams and only 29 per cent of the students in the lower streams were white (Oakes, 1985). King's (1986) study, The Adolescent Experience, reported that the Toronto Board of Education conducted a study in 1983 that found that 126 out of 442 black students (30 per cent) who entered grade nine in 1982 were funnelled into basic level courses while only 17 per cent of white students were placed in the basic stream.

In its response to the Radwanski report, Ontario Secondary School Teachers' Federation (June 1988) expressed the view that the intent of streaming was never to disadvantage students but rather to meet the needs of the individual students in homogeneous groupings to better use financial and human resources and time for that purpose was, and is, the object of streaming. The Ontario Secondary School Teachers' Federation acknowledged the need to improve the present system but would have preferred to stay with it until destreaming had a chance to be tried and tested. Even ardent supporters of destreaming cautioned against a rapid change to heterogeneous grouping until the Government and Boards of Education make the on-going financial commitment to provide the resources and curricula needed to make the transition.

Recent studies in Canada indicated that 30 per cent of all students leave school without a secondary diploma. Minimally educated workers

represented heavy costs to society through greater use of health care, welfare, and unemployment insurance systems. Oppenheimer (1991) stated that the education system was dysfunctional for students moving directly into the workplace and for at-risk students. Oppenheimer, Getting it Right (1990), and Hargreaves and Earle, Rights of Passage (1989), indicated that the current streamed secondary school system was not meeting the social, personal, and developmental needs of young adolescents. Ironically, the very document indicated by Radwanski, Ontario Schools: Intermediate, Senior (1984) stated "To meet the needs of a wide variety of students, the school should attempt to extend its role beyond the provision of courses and programs".

For many potential dropouts, the middle grades were the last chance to change a pattern of failure. McCarthy, (1992) reported figures by Statistics Canada that clearly indicated that the level of education is a key variable in who gets and keeps jobs. About 23 per cent of people under the age of 24 who failed to complete high school were unemployed in January, 1992 compared to 18 per cent of young high school graduates and 12 per cent of those who completed college or university. The federal government has highlighted Canada's high dropout rate of 30 per cent, as a key concern in its drive to make the country internationally competitive.

Summary

In terms of academic achievement, research findings seemed to come out on the side of destreamed systems although many studies remained inconclusive (Brophy and Good, 1974; Findley and Bryan, 1975; Kulik and Kulik, 1982, 1987; Petersen, 1988). In their literature review, Rights of Passage (1990), principal investigators, Andy Hargreaves and Lorna Earle concluded:

> In many ways, "destreaming" is a distraction from the fundamental issues of providing effectively for students in the Transition Years and giving all students sufficient opportunity to learn. *Destreaming only deals with the issue of putting bodies into rooms.* One of the reasons why much of the research on the academic effects of destreaming is inconclusive is that it does not address what is done with those bodies once they have been placed in classrooms. Students in destreamed classes can be taught many different things in many different ways. Destreaming creates an opportunity for them to be taught these things together. The critical issues for their learning are really what they are taught (curriculum) and how they are taught (instruction). More important than the management of destreaming is the meaning of it for those who work with destreamed classes. For this reason, we view destreaming as a preliminary or subsidiary issue. (p. 15) (italics are the writer's)

Hargreaves and Earle concluded that in terms of policy, destreaming was a "fait accompli". They went to great lengths to summarize the obvious needs and characteristics of the adolescent learner yet as seen in the italics above, they trivialized the key issue in destreaming to a rather minimal administrative detail dealing with the "issue of putting

bodies into rooms."

In a rather exhaustive search of the literature surrounding destreaming the writer has not found any direction or guidance as to a methodology or process for ensuring that classes are indeed "destreamed" and not merely "delabled". It is the writer's contention that importance must be placed upon this administrative detail of putting bodies into rooms especially during these formative beginnings to this major educational change.

CHAPTER III

ANTICIPATED OUTCOMES AND EVALUATION INSTRUMENTS

Goals and Expectations

The major goal of this practicum was to develop and implement a systematic process for placing grade 8 students into grade 9 classes in such a way as to ensure that they were heterogeneously mixed. Every attempt was made to assess each individual grade eight student in a holistic fashion with particular sensitivity to a number of variables. In short the goal was to create truly destreamed grade 9 classes whose mean holistic score was consistent and which reflected a consistent mix of gender, racial background, special education identification and feeder school origin.

Expected Outcomes

It was hoped that upon the completed implementation of this practicum, all grade 9 classes at the subject school would be demonstrably destreamed. The heterogenous mixing included the following variables: ability level, gender, racial background

(ethnicity), special education identification, and feeder school attended in grade 8.

Standard of Performance

It was the intention of the writer of this practicum that 100 per cent of the grade 9 classes would be heterogeneously mixed according to the above mentioned variables.

Measurement of Outcomes

The assessment instruments were comprised of frequency charts for the gender, racial background, special education identification, and feeder school. These frequencies were presented in chart form for each class created. A normal curve was developed from the holistic scores of all incoming grade 9 students. A standard deviation was established for all of the incoming grade 9 student scores on the holistic scale. The mean score of each heterogeneously mixed class was then plotted on this curve to demonstrate that all classes were within one standard deviation of the mean score of all in-coming grade 9 students.

Mechanism for Recording Unexpected Events

During the implementation, the writer maintained a reflective log

in which questions and insights which emerged were noted. Once the data was collected and the students were placed in homebase groupings, difficulties that arose or problems encountered were noted. Where possible, problems were dealt with collaboratively with the school administration, and appropriate changes were made.

Process Objectives

The implementation of this practicum was facilitated by the writer's involvement in three other very important dimensions. Firstly, the success of this practicum depended highly upon the development of a timetable which would support the outcomes through a structure which allowed the placing of these heterogeneously mixed classes in a way that avoided student timetable conflicts. While this dynamic was not directly in the writer's control, there was collaboration between the writer and the school administration in the development of a compatible timetable.

Secondly, the success of this practicum depended upon the continued acceptance of a new initiative for grade 9 classes whereby a group of students would stay together as a cohort for core subjects in what was referred to as a "homebase". The literature has shown that a "sense of ownership" can be fostered through the implementation of such a system (King & Peart, 1990) and the results of the pilot project (Brydges & Cousins, 1993) at the subject school, demonstrated that a homebase

system affected students' sense of belonging. The writer has been a co-chair for a committee which recommended the implementation of such a program beginning in September 1993, and it was anticipated that in light of favourable, formative results, the program would continue.

Thirdly, the writer revised and utilized a form developed for the Transition Years Pilot Project at the subject school for the purpose of gathering data on the ability level (Appendix A) of in-coming grade 8 students as reported by their teachers. The variables included in this rubric were chosen through the collaboration of elementary school teachers, secondary school teachers, school administrators, the student services head, several guidance counsellors, parents, students and Board of Education superintendents who sat on the Transition Years Advisory Council chaired by the writer. While the rubric was piloted during the Pilot project in 1992-93, several weaknesses were discovered and the writer proposed changes to the rubric and format of the form which were approved by the school administration for implementation. These holistic scales were scored by hand, the sum of each student's then used for heterogeneous mixing purposes. It was discovered during the Pilot Project, that the importance, the purpose and the use of these rubrics were best communicated through a direct contact with the grade 8 teachers and the administration agreed to accomplish this through a special breakfast meeting with the feeder school principals and grade 8

teachers. The writer presented justification for and use of the scoring rubric at this meeting.

CHAPTER IV

SOLUTION STRATEGY

Discussion and Evaluation of Possible Solutions

The problem which was addressed by this practicum simply stated was as follows: There was an absence of any method or process for ensuring that grade 9 classes were demonstrably destreamed. While some literature referred to the problem, "Destreaming only deals with the issue of putting bodies into rooms." (Hargreaves & Earle, 1990, p.15), the writer was unable to find any writings which prescribed or recommended a methodology for addressing the problem.

In discussion with others who have been faced with this challenge, the writer became aware of five methods which dealt with this matter.

1. School administrators could ignore the problem and pass on the challenge of teaching unevenly mixed, supposedly destreamed classes to the teachers.

2. A similar solution would be to allow the computer to randomly place students in classes.

3. The advanced, general and basic labels could be removed from the

grade 9 classes allowing students to select their own timetables on the basis of their options.

4. A much smaller, sister school ran a "National Hockey League" type draught pick with grade 8 and 9 teachers in attendance bidding on each student as their names were raised and discussed.

5. Some have suggested that the problem of students streaming themselves by their choices could be addressed through the building of a better timetable which takes such streaming into account.

6. A method and process for analyzing in-coming students according to ability, gender, ethnicity, special educational identification, and feeder school attended could be devised. On the basis of the outcomes of this analysis, students could then be placed in equal proportions in each grade 9 class to ensure truly heterogeneously mixed classes. An analysis of the final outcome would demonstrate that this had in fact taken place. This method would rely upon a compatible timetable and acceptance of a homebase style of school organization.

Option 1, in which the administration of the school passes on the challenge of teaching unevenly mixed classes to the teacher, several curriculum problems emerged. One must remember that the Transition Years Initiative was a major innovation which essentially demanded the re-writing of curriculum designed for advanced, general and basic level ability groups into a package which would meet the learning needs of a

heterogeneously mixed class. When classes were not truly mixed heterogeneously, a teacher was forced to adapt the curriculum as many as three times a day in a semestered system and as many as six times every two days in a non-semestered system. It was the informed opinion of the writer that this was placing an unreasonable burden on the specialist subject teacher and choosing this option only prolonged a system of education for students which as shown by the literature, may be inequitable. In some schools, the writer documented teachers who referred to various groupings of students as their "destreamed advanced class" or even more descriptively "my destreamed dummy class".

In regards to option 2, the writer agreed that it would indeed be a marvellous advantage to allow technology to solve the difficulty by letting the computer randomly select classes for students. There were two major problems with this scenario. Firstly, since computers have been introduced to schools to assist with timetabling, they have demonstrated that they do not load classes randomly and in fact the history of their use has shown just the opposite. Computers merely respond as they are directed and in all instances familiar to the writer, it is the students who choose the subjects and ultimately direct the computer to select their classes thus resulting in a form of streaming by choice. Secondly, computers will not act truly randomly unless directed to do so according to algorithms and a set of variables.

Data must be collected and entered regarding each of these variables before the computer can complete its random selection. The writer believed that a data-base program might be a very real asset when addressing this challenge, particularly if it relied on a process which had been proven successful.

The third, (3) option of removing labels from courses which allowed students to select their timetables according to their option choices was been implemented in the majority of schools within the scope of the writer's experience. This resulted in the kinds of teacher comments related in the writer's critique of option 1 above. This passive approach to the challenge did not address the fundamental problem of students streaming themselves according to such criteria as peer pressure, parental pressure, amount of homework reported and second-hand reputation of teachers passed on from previous students. Qualitative data gathering on the issue demonstrated that the outcome with option three is only a variation on a theme similar to the outcome of option 1.

Option 4, the NHL style draught pick, was an innovative approach to the problem and at its core, recognized the need to truly mix classes, at least according to ability, gender, and feeder school. The writer believed that the results of such a method would have a high probability of achieving the desired outcomes. The weaknesses of this method

however had more to do with the size of the school in which it was used; a small rural school of 650 with only 90 incoming grade 9 students from 3 feeder schools, and the transferability to the subject school with 250 incoming grade 9 students and 13 feeder schools. Although meritous for many other reasons related to improving dialogue between elementary and secondary schools, the logistics of orchestrating such an activity for a large school made it prohibitive. The other weak dimension of this option for the subject school was the difficulty in actually quantifying the results in order to prove that the outcome had been achieved.

The writer agreed that a well constructed timetable proposed in option 5, was paramount to achieving heterogeneously mixed classes, however in isolation it would not produce the desired outcome. Many well constructed timetables have minimized the self-streaming effect in the past, however one must remember that timetables reflect the total curriculum needs of the school and the placing of teachers, students, and courses into available classroom space, becomes a three dimensional challenge of great magnitude where the additional variables of ability, gender, ethnicity, special education identification and feeder school tended only to complicate an already difficult task. Achieving heterogeneous mixing through timetable considerations alone was almost impossible.

Description and Justification for Solution Selected

The solution strategy 6, which the writer proposed, addressed all of the needs expressed above by simplifying the process and systematically gathering data for analysis and decision making while making sure that the achieved outcomes were demonstrable.

The process proceeded as follows:

1. The writer solicited and received the full co-operation of the school administration and the site based committees with this practicum. At this point a joint decision by the High School principal and the writer was made to eliminate ethnicity as a criteria for mixing classes. The subject school was located in a rural farming community and maintained a very static population over many years. The ethnic make-up of the population was recorded as 94% white anglo saxon (Canadian Census, 1991) and there were no indications of difficulty with ethnic group mixing into the school culture. A recent survey (Brydges et al. 1993) showed that 98.6% of the teachers at the subject school indicated that "A teacher from another cultural/ethnic background would be accepted socially in our school." and 97.3% of the same teachers indicated that "A student from another cultural/ethnic background would be accepted socially in our school." This result was echoed by the student population (mean score of 4.16) who agreed with

the statement that "A person from another country/religion would be readily accepted as a member of your student body." (score 4 = agree; score 5 = strongly agree). On the basis of these results and with the indication from feeder school principals that less than 1% of the incoming students would be members of an ethnic minority, the decision was made to eliminate ethnicity as a criteria for heterogeneous mixing of classes. The criteria could easily be added to the data base should the subject school perceive a future need in this regard.

2. The tool for quantifying ability, gender, special education identification, and feeder school attended (Appendix A) was refined and implemented with the co-operation of the feeder school principals. This holistic scoring rubric and information sheet was disseminated at a breakfast meeting which included the feeder school principals and grade 8 teachers.

3. Grade 8 teachers were in-serviced at a breakfast meeting hosted by the subject school, as to the justification, value and use of the holistic scoring rubric.

4. The data (ie. holistic scales completed by grade 8 teacher, and student status information) was gathered from the feeder schools.

5. A student/school timetable (Appendix B) was developed which virtually eliminated any grade 9 timetable conflicts and facilitated the placing of students into homebase cohorts. The development of this

timetable relied upon administrative decisions made collaboratively with the teaching faculty, regarding which subjects would be core subjects and which subjects would be optional. This decision was greatly assisted by the outcomes of a Transition Pilot Project in 1991-92 (Brydges, & Cousins, 1993). The writer was involved in the development of this timetable to ensure that it would be compatible with the practicum.

6. Standard deviations of the holistic scores were established, a normal curve developed and students were assigned to homebase cohorts according to the above criteria. The writer facilitated this through the use of the data base software package (Lotus 123 4.01 Windows, 1993). (see Appendix C for sample set up). It became evident at this point in the implementation that an accomodation had to be made for the fact that the subject school was host to two French Immersion classes. These students, by virtue of their specialty, stayed together for their core courses to facilitate instruction in the french language (see chapter V, Table 1, Homebases I and J). Comments of teachers have indicated in the past that the student who has typically chosen French Immersion in the subject school community, tended to be bright, hard working students who were highly motivated to learn in a second language. This was substantiated by the fact that the mean average holistic score for the two french immersion classes was 24.35 which was

more than two standard deviations above the holistic mean score of the other eight classes (20.40). The students in this program were from two different feeder schools which the writer to mixed as evenly as possible, however the program had a high female enrollment with only 6 males in one class and 5 males in the other. (see Chapter V, Table 2)

A second accomodation became necessary at the request of the head of the special education department who required a large number of identified exceptional students receiving level II service (a learning strategies class), to be placed in homebase groupings which had english and core french in the first semester. This facilitated the placement of these students into learning strategies classes replacing core french and allowing special education teachers an opportunity to focus on learning strategies related to english skills in reading and writing. The results of this special education accomodation plus the french immersion accomodation documented above, resulted in the placement of identified students being slightly skewed. The high school principal and the writer agreed however, that the distribution (see Chapter V, Table 3) was much more equitable than it would have been if done randomly.

7. Optional classes were loaded manually so as to ensure that the criteria was met and that these classes achieved the heterogeneous mixing outcome with the highest possible degree of reliability. It had

been hoped that these optional subjects could be heterogeneously mixed with the same degree of reliability as the core subjects. While this was possible with optional subjects that had multiple sections, it became obvious that it would be untenable to mix single section courses, (e.g. black light drama ADA 1WE) heterogeneously. This was a primary driving factor in the develoment of the timetable. By virtue of the 6 core subjects and two optional subjects, grade nine students took four courses per semester, three of which are deemed core subjects (taken from English, Mathematics, Science, Physical Education, French, and Geography) and one optional subject (taken from Keyboarding, Family Studies, Music, Art, Drama, and Technical Studies). Optional subjects were then timetabled all together in a single time-slot (see Appendix B, period 4 each semester) which facilitated ease of heterogeneously mixing core courses. When there was more than one section of an optional course, (ie. Keyboarding, BKI 1W0) these were heterogeneously mixed using the same method as the core subjects.

8. The final step was to analyze the cohorts to measure the heterogeneous mixing and verify the outcomes. These results are discussed in Chapter V.

CHAPTER V

RESULTS, DISCUSSION, AND RECOMMENDATIONS

Results

The goal of this practicum was to develop and implement a systematic process for placing grade 8 students into grade 9 classes in such a way as to ensure that they are heterogeneously mixed according to ability level, gender, ethnicity, special education identification and feeder school attended. The literature search revealed that no such method or process existed for mixing grade 9 classes heterogeneosly in a demonstrable manner.

The writer, in co-operation with the subject school principal and site-based committees, developed the process outlined in Chapter IV, which systematically gathered data for analysis and decision making regarding the placement of students into classes so that it could be demonstrated that they had indeed been heterogeneously mixed.

The results of this process in the subject school are documented below.

Mixing according to ability:

Ability mixing was facilitated through the use of a holistic scoring rubric completed by the grade 8 teacher (Appendix A)

Table 1

Mean Holistic Ability Scores of Students in Each Homebase

Homebase	Mean holistic score
A	20.48
B	20.72
C	20.64
D	20.08
E	20.07
F	20.63
G	20.53
H	20.04
I	25.14
J	23.55

Table 1 represents the mean holistic ability scores of students in each homebase. This table demonstrates that the 25 students in each homebase have been mixed heterogeneously within one standard deviation (STD = 1.64) of the mean (mean = 21.19) according to ability. These students will stay together for instruction in the six core subjects with individual timetables for the optional subjects . Homebases "I"

and "J" are the french immersion classes receiving a percentage of instruction in some core subjects in the french language. As indicated above, this program has tended to attract bright, motivated students from professional families and when assigned to the two designated homebases as required by the program, skew the distribution of holistic scores negatively.

Mixing according to gender:

Table 2

Gender Distribution in Each Homebase

Homebase	Male students	Female students
A	13	12
B	13	11
C	13	12
D	13	12
E	12	13
F	12	12
G	12	13
H	11	12
I	6	15
J	5	15

Table 2 represents the gender distribution on students in each homebase. In homebases A through H the praticum was able to achieve a

distribution which included no more than 13 and no less than 11 students per gender in each homebase. The french immersion homebases, I and J, were skewed negatively towards the male end as a result of this program attracting an almost 3 to 1 ratio of females to males.

Mixing according to special education identification:

Table 3

Distribution of Special Education Identified Students by Homebase

Homebase	Identified Students
A	7
B	7
C	6
D	6
E	6
F	5
G	5
H	5
I	1
J	1

Table 3 demonstrates the distribution of special education identified students by homebase. Results of this distribution are skewed as a result of both the small number of identified students in the french immersion program and to accomodate a request by the Head of

the Special Education Department to have all students who were taking learning strategies (n = 32) in place of core french in homebases A through E to assist in coordination of their english curriculum with the learning strategies. The principal of the school was pleased with a more equitable distribution than had been the experience in previous years.

Mixing according to maximum number of students from any one feeder school:

Table 4

Maximum Number of Students from Any One Feeder School in Each Homebase

Homebase	Maximum number of students from one feeder school
A	6
B	5
C	7
D	6
E	6
F	7
G	7
H	5
I	11
J	11

Table 4 demonstrates that the practicum was able to achieve a mix

which included no more that 7 students from any one of the 13 feeder schools with the exception of the french immersion program. Because the french immersion program had only two feeder schools from which it drew, their numbers are inconsistent with the rest.

Discussion

In their literature review, Rights of Passage (1990), principal investigators, Andy Hargreaves and Lorna Earle concluded that "destreaming only deals with the issue of putting bodies into rooms." It was the writer's view, that this observation was indeed understated and while the raison d'être for heterogeneously mixing classes remained paramount, teachers and administrators were given little if any assistance with process for achieving this outcome. The method proposed by the writer in this practicum has demonstrated a process whereby classes can be heterogeneously mixed according to a number of critical variables. While the subject school chose common variables such as ability, gender, special education identification and feeder school, any number of variables could be added including that of ethnicity at the discretion of the school. It has been demonstrated qualitatively, that teachers have had to adapt curriculum according to the mean ability of different classes. The process presented here has the potential to virtually eliminate this dynamic.

The exceptions which the writer had to contend with in the

implementation of this practicum were the special curriculum needs of particular groups of students such as those in the french immersion program and learning strategies classes, however the process was friendly to these features and the outcomes remained achievable for the majority of the students.

Other important dynamics of the practicum included a compatible timetable that would not be driven in its structure by the option choice of the grade 9 students. Closely linked with this was the classroom, cohort, whereby students would travel together for their core subjects.

The wholistic rating form for grade 8 students, which was filled in by their teachers, was central to the placing of students into heterogeneously mixed ability groups. This form was revised for purposes of this practicum and one of the recommendations of the writer is that the criteria indicators undergo further revisions so as to assure consistency in the forms use.

Recommendations

While, the writer has established qualitatively in a limited manner the advantages of heterogeneously mixing classes, there is a need to follow-up this process with a study of the affect of such precise mixing on both teacher and student performance. While it is hypothesized that teachers would have to spend less time adapting their curriculum to

ability level swings in the classroom, and that the time saved might be used on such areas as improving assessment techniques for heterogeneous classes, the writer would recommend that such a study be undertaken to verify this hypothesis. A study of the affects of precise heterogeneous mixing could uncover other potential variables to be considered in the improvement of student mixing.

Some concern has been expressed at the subject school regarding potentially negative affects of having a group of students travel together from class to class (ie. cohort) for such a concentrated period of time. There may have been the need to develop a algorithmic computer program which would mix each individual core subject class while maintaining the value and integrity of heterogeneously mixed classes as mandated by the Ministry of Education. Further study of this dynamic would verify the importance of mixing these students further.

Finally the process proposed by the writer in this practicum has proven to be rather labour intensive. While this has been largely due to the trial and error method used herein, the importance of having all of the data collected prior to implementing the actually sorting procedure cannot be overemphasized. Changes in department preferences, additional new students, teaching timetables, and room allocations all figure into the process and should be throughly discussed and decided upon prior to implementation. In this regard, the writer also

recommends the use of new scanning technology such as Teleform 3.0 for windows (1994), to reduce the data entry time and the scoring of the individual holistic rubrics.

Plans for dissemination:

The writer has been listed in the reference and resources of Grass Roots II, More Practical Strategies for the Transition Years, a publication of the Ontario Secondary School Teachers' Federation, Toronto, Canada,1993, resulting in a number of invitations to present the practicum to various schools and Board of Education groups. Two schools in particular have begun a process for implementing a modified version of this program and will feedback data as to the dynamics of the implementation. The writer also proposes to make a submission to the Association of Educational Researchers of Ontario (AERO) to present a paper on this process at its annual conference.

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APPENDIX A

WHOLISTIC RATING SCALE FOR GRADE 8 STUDENTS

E.N.S.S. GRADE EIGHT
STUDENT INFORMATION SHEET

39

☐ MALE
☐ FEMALE

ELEMENTARY SCHOOL _____ NAME OF STUDENT _____

EVALUATE EACH STUDENT. USING THE SCALE BELOW:

	NEEDS IMPROVEMENT	AVERAGE	EXCELLENT
Academic Performance	1	2	3
Study habits	1	2	3
Attitude	1	2	3
Attendance	1	2	3
Peer Relationships	1	2	3
	BELOW	**GRADE 8**	**AHEAD**
Level of Instruction	1	2	3
	RARELY	**SOMETIMES**	**OFTEN**
Class Participation	1	2	3
Sports/Clubs Participation	1	2	3
Leadership	1	2	3
	NEVER COMPLETED	**USUALLY COMPLETED**	**ALWAYS COMPLETED**
Homework/Assignment Completion	1	2	3

2. **Please list any achievements/awards that you are aware that the student has achieved:**

_____

_____

3. **Recommendations for special assistance/services:**

_____

_____

4. Is student Identified? Yes ___ No ___
(Circle one) Level of service I II III

5. Additional comments/recommendations:

_____

_____

_____ _____

PRINCIPAL GRADE 8 TEACHER

APPENDIX B

GRADE 9 STUDENT TIMETABLE

GRADE 9 HOMEBASE TIMETABLE

	SEMESTER 1				SEMESTER 2			
	1	2	3	4	1	2	3	4
A	ENG	GCA	FSF	OPTN	PHM/F	MAT	SNC	OPTN
B	FSF	ENG	GCA	OPTN	PHM/F	SNC	MAT	OPTN
C	ENG	FSF	PHM/F	OPTN	MAT	GCA	SNC	OPTN
D	FSF	ENG	PHM/F	OPTN	SNC	GCA	MAT	OPTN
E	ENG	FSF	GCA	OPTN	SNC	MAT	PHM/F	OPTN
F	SNC	PHM/F	MAT	OPTN	ENG	FSF	GCA	OPTN
G	GCA	SNC	MAT	OPTN	ENG	PHM/F	FSF	OPTN
H	MAT	PHM/F	SNC	OPTN	FSF	GCA	ENG	OPTN
I	FEF	MAT	SNC	OPTN	GCAF	ENG	PHM/F	OPTN
J	SNC	MAT	FEF	OPTN	ENG	PHM/F	GCAF	OPTN

SEMESTER I

NFG 1W0-01 1 section
BKI 1W0 - 01
BKI 1W0-02 } **3 sections**
BKI 1W0-03
ADA 1WE-01 1 section blcklght
AVI 1W0-01 1 section
AMI 1W0-01
AMI 1W0-02 } **2 sections**
TGJ/TMJ 1W0-01
TGJ/TMJ 1W0-02 } **2 sections**

SEMESTER II

NFG 1W0-02 1 section
BKI 1W0-04
BKI 1W0-05 } **3 sections**
BKI 1W0-06
ADA 1W0-01 1 section reg.drama
AVI 1W0-02 1 section
AMI 1WE-01 1 section
TAM/TCW-01
TAM/TCW-02 } **2 sections**
AMV 1W0-01 1 section @ gr.10's

APPENDIX C

SAMPLE DATABASE SET UP
FOR LOTUS 123 4.01 FOR WINDOWS, 1993

LAST	FIRST	GENDER	SCHOOL	SCORE	ID	FR.IMM.	HOMEBSE	SEM I	SEM II
	SUNDAY	F	COLBRNE	22	N	N	B	BKI02	AMV
	JAMES	M	BRIGHT	24	N	N	B	TGJ/TMJ	BKI06
	GREG	M	STOCK	22	N	N	B	BKI03	AVI
	SARAH	F	CASTLE	27	N	N	B	BKI01	NFG
	JARED	M	SMITH	21	Y2	N	B	BKI03	AMI
	JODY	M	STOCK	21	Y1	N	B	AVI	BKI04
	WESLEY	M	COLBRNE	16	Y2	N	B	AVI	TAM/TCW
	MELISSA	F	CASTLE	19	N	N	B	NFG	ADA
	JERRY	M	CRAMAHE	26	N	N	B	AVI	BKI05
	STEFANIE	F	BRIGHT	14	Y3	N	B	AVI	ADA
	MICHAEL	M	COLBRNE	18	N	N	B	BKI03	NFG
	JAMIE	M	SMITH	15	N	N	B	AMI	TAM/TCW
	EMMA	F	STOCK	21	N	N	B	NFG	BKI06
	CARRIE	F	STOCK	20	N	N	B	NFG	BKI05
	NATHAN	M	CASTLE	21	N	N	B	BKI03	ADA
	CHAD	M	COLBRNE	16	N	N	B	NFG	TAM/TCW
	SHAWN	M	BRIGHT	19	Y3	N	B	BKI03	NFG
	GEOFF	M	STOCK	23	N	N	B	AVI	BKI04
	ANGELA	F	BRIGHT	16	Y2	N	B	NFG	AVI
	RACHEL	F	MURRAY	24	N	N	B	BKI02	TAM/TCW
	STEPHANI	F	CRAMAHE	27	N	N	B	AMI	BKI06
	ANDREA	F	BRIGHT	25	N	N	B	AMI	NFG
	ADAM	M	SMITH	15	Y2	N	B	AMI	BKI04
	ANJELA	F	CRAMAHE	29	N	N	B	AMI	BKI06
	CHRIS	M	SMITH	17	N	N	B	BKI03	TAM/TCW